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Application Serial No. 10/577,532  
Reply to office action of March 25, 2009

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PATENT  
Docket: CU-4801

**Amendments To The Claims**

The listing of claims presented below will replace all prior versions, and listings, of claims in the application.

**Listing of claims:**

1. (currently amended) An on-channel repeater which receives [[the]] a signal on one channel and distributes the signal on the same channel, the on-channel repeating apparatus comprising:

a receiving means for receiving a Radio Frequency (RF) broadcast signal transmitted from outside;

a demodulating means for demodulating the RF signal received [[in]] by the receiving means into a baseband signal, and for extracting a carrier frequency and a sampling timing offset;

an equalizing means for equalizing the baseband signal obtained from the demodulation in the demodulating means to thereby obtain a baseband output signal;

a modulating means for modulating the baseband output signal from the equalizing means into an RF signal based on the carrier frequency and the sampling timing offset; and

a transmitting means for transmitting the RF signal obtained from the modulation in modulating means.

2. (previously presented) The on-channel repeater as recited in claim 1, wherein the demodulating means includes:

an intermediate frequency (IF) down-converting unit for down-converting the received RF signal into an IF signal; and

a demodulating unit for demodulating the IF signal obtained from the frequency down-conversion into a baseband signal.

3. (previously presented) The on-channel repeater as recited in claim 1, wherein

Application Serial No. 10/577,532  
Reply to office action of March 25, 2009

PATENT  
Docket: CU-4801

the modulating means includes:

- a modulating unit for modulating the baseband output signal outputted from the equalizing means into an IF signal; and
- an RF up-converting unit for up-converting the IF signal into an RF signal.

4. **(currently amended)** An on-channel repeating method for receiving the signal on one channel and distributing the signal on the same channel, the on-channel repeating method comprising the steps of:

- a) receiving a Radio Frequency (RF) signal transmitted from outside;
- b) demodulating the RF signal into a baseband signal and extracting a carrier frequency and a sampling time offset;
- c) equalizing the baseband signal to thereby obtain a baseband output signal;
- d) modulating the baseband output signal into an RF signal based on the carrier frequency and on the sampling time offset; and
- e) transmitting the RF signal obtained from the modulation, wherein the modulation and demodulation at the steps b) and d) are carried out based on a reference frequency signal provided by a local oscillator.

5. (previously presented) The method as recited in claim 4, wherein the step b) includes:

b1) down-converting the received RF signal into an intermediate frequency (IF) signal; and

b2) demodulating the IF signal obtained from the frequency down-conversion into a baseband signal.

6. (previously presented) The method as recited in claim 4, wherein the step d) includes:

d1) modulating the baseband output signal outputted from the equalization in the equalizing means into an IF signal; and

d2) up-converting the IF signal into an RF signal.

Application Serial No. 10/577,532  
Reply to office action of March 25, 2009

PATENT  
Docket: CU-4801

7. (previously presented) The on-channel repeater as recited in claim 1, further comprising:

a local oscillating means for providing a reference frequency signal to the demodulating means and the modulating means.

8. (currently amended) ~~The An on-channel repeater as recited in claim 7, wherein the demodulating means extracts a carrier frequency and a sampling timing offset, and the modulating means modulates the baseband output signal into an RF signal based on the carrier frequency and the sampling timing offset, which receives a signal on one channel and distributes the signal on the same channel, the on-channel repeating apparatus comprising:~~

a RF receiving means for receiving a Radio Frequency (RF) broadcast signal having a first reference frequency;

an IF down-converting means for converting the received RF broadcast signal into an Intermediate Frequency (IF) signal based on a first reference frequency signal;

a local oscillating means for providing the first reference frequency signal to the IF down-converting means and for providing a second reference frequency signal to a modulating means;

the demodulating means for demodulating the IF signal into a baseband signal and for extracting a carrier frequency and a sampling time error;

an equalizing means for equalizing the baseband signal obtained from the demodulation in the demodulating means to obtain a baseband output signal;

the modulating means for modulating the baseband output signal from the equalizing means into an RF signal based on the carrier frequency and on the sampling timing offset to generate an IF signal and for converting the IF signal into the RF signal based on the second reference frequency; and

a transmitting means for transmitting the RF signal obtained from the modulating means.

Application Serial No. 10/577,532  
Reply to office action of March 25, 2009

PATENT  
Docket: CU-4801

9. (previously presented) The on-channel repeater as recited in claim 7, further comprising: a Global Positioning System (GPS) receiving means for receiving a GPS reference signal to synchronize frequency of the transmitting signal with frequency of received signal and dividing the GPS reference signal for the demodulating means, the modulating means, and the local oscillating means.

10. (previously presented) The on-channel repeater as recited in claim 1, wherein the demodulating means includes:

an IF down-converting unit for down-converting the received RF signal into an IF signal; and

a demodulating unit for demodulating the IF signal obtained from the frequency down-conversion into a baseband signal, and the modulating means includes:

a modulating unit for modulating the baseband output signal outputted from the equalizing means into an IF signal; and

an RF up-converting unit for up-converting the IF signal into an RF signal.

11. (previously presented) The on-channel repeater as recited in claim 10, further comprising a local oscillator for providing a reference frequency signal to the IF down-converting unit and the RF up-converting unit.

12. (currently amended) The on-channel repeater as recited in claim 11, wherein the ~~demodulating unit extracts a carrier frequency and a sampling timing offset, and the modulating unit modulates the baseband output signal into an IF signal based on the carrier frequency and the sampling timing offset~~ local oscillator provides a first reference frequency to the demodulator and provides a second reference frequency to the modulating unit.

13. (previously presented) The on-channel repeater as recited in claim 11, further comprising:

Application Serial No. 10/577,532  
Reply to office action of March 25, 2009

PATENT  
Docket: CU-4801

a GPS receiving means for receiving a GPS reference signal to synchronize frequency of the transmitting signal with frequency of received signal and dividing the GPS reference signal for the demodulating unit, the modulating unit and the local oscillator.

14. (currently amended) The method as recited in claim 4, wherein ~~the modulation and demodulation at the steps b) and d) are carried out based on a reference frequency signal provided by a local oscillator~~ local oscillator provides a first reference frequency to the demodulator and provides a second reference frequency to the modulating unit.

15. (currently amended) The method as recited in claim 14, wherein ~~a carrier frequency and a sampling time offset are extracted at the step b), and the baseband output signal is modulated into an RF signal at the step d) based on the carrier frequency and the sampling time offset~~ wherein the demodulator includes an IF downconverting unit.

16. (previously presented) The method as recited in claim 14, further comprising a step of:

f) generating an oscillation signal needed for the demodulation and modulation at the steps b) and d) by dividing a Global Positioning System (GPS) reference signal received in a GPS receiver.

17. (previously presented) The method as recited in claim 4, wherein the step b) includes:

b1) down-converting the received RF signal into an IF signal; and  
b2) demodulating the IF signal obtained from the frequency down-conversion into a baseband signal, and the step d) includes:

d1) modulating the baseband output signal outputted from the equalization in the equalizing means into an IF signal; and

Application Serial No. 10/577,532  
Reply to office action of March 25, 2009

PATENT  
Docket: CU-4801

d2) up-converting the IF signal into an RF signal.

18. (previously presented) The method as recited in claim 17, wherein the frequency down-conversion at the step b1) is performed based on a first reference frequency signal provided by local oscillator, and the frequency up-conversion at the step d2) is carried out based on a second reference frequency signal provided by the local oscillator.

19. (previously presented) The method as recited in claim 18, wherein the a carrier frequency and a sampling time offset are extracted from the IF signals obtained from the frequency down-conversion at the step b), and the baseband output signal is modulated into an IF signal at the step d) based on the carrier frequency and the sampling time offset.

20. (previously presented) The method as recited in claim 18, further comprising a step of:

g) generating an oscillation signal needed for modulation/demodulation and IF/RF frequency conversion by dividing the GPS reference signal received in the GPS receiver.